Background and aim: The new pacemaker (PM) generations featuring extended memory functions (MF) document the occurrence of arrhythmias over periods of several months. Recordings of all atrial episodes and their characteristics contribute to the efficacious treatment of these patients. However, ventricular arrhythmia (VA) characteristics and occurrences are less well-known in this population. The goal of this study was to evaluate the pertinence of MF at the ventricular level and to describe the MF-documented VAs.

Methods & Results: the study involved a continuous series of 93 pts (M 66%, aged 75±10 yrs) implanted with SC or DC Kappa and EnPulse PMs (Medtronic, MN, USA) for AVB 41%, SD 55%. 497 visits were analyzed (follow-up at 7 months avg.) over a period from 2 to 81 months after implantation, and occurrences of VA validated by EGMs, defined by at least 5 QRS complexes >175/mn. The number of episodes and the duration and heart rate during the longest arrhythmia episodes were recorded. 24 pts (26%) average ages 74 ± 13 yrs of whom 78% males, showed ventricular arrhythmias in 88 visits (18%). The average number of episodes was 9 per follow-up (1-140), average duration was 4 ±4 seconds (1-27 sec), and average rate was 214 ± 33 bpm. (174-307). The totality of the episodes were classified as non-sustained ventricular tachycardia (NSVT). The ejection fraction was 51±11%. 84% showed cardiopathy : CAD (12), HCM(4) and DCM (4). Statistical analysis showed that age, pacing indication, pacing mode and cumulated percentage of pacing are not relevant factors in NSVT.

Conclusion: VAs are observed in π of pts implanted for standard pacing indications. A major determining factor in the occurrence of NSVT is the presence of an associated cardiopathy. FMs featuring EGM recordings are a tool for reliable diagnostic and monitoring of these events. Further studies are required to evaluate the prognostic significance of these VAs.

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The SLEW-RATE : a predictive parameter to evaluate the interface Lead / Myocardium

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We suggested being interested in the theoretical and practical aspect of the slew-rate measurement, to obtain an evaluation of the relation between this measure and the other measures done during implantation and follow-up such as the stimulation thresholds, the value of the EGM and the impedance. The variation of this parameter will inform us about the quality of the interface lead/myocardium.

Method: The study recruited 746 patients not selected a priori, implanted for AV block (51%) or sinus dysfunction (47%). 847 leads were retained to form 3 homogeneous and comparable groups for their physical, electric characteristics and their site of implantation for atrial and ventricular chambers. They correspond to the optimal characteristics (Gr1), acceptable (Gr2) and not acceptable (Gr3) of sensing and pacing parameters usually admitted by the literature.

Results: For auricular chamber, we retained a priori, 56 leads (Gr1), 168 for (Gr2) and 15 for (Gr3); the factorial discriminate analysis (FDA) was realized from the variables of slew-rate, sensing per and post-op and threshold per and post-op gives us a result of 83.7% of individuals good classified.
For the ventricular chamber, we retained a priori, 183 leads (Gr1), 168 (Gr2) and 9 (Gr3); the FDA realized from the same variables gives us a result of 80 % of individuals good classified.
The comparison of the averages between groups for every variable shows a significant difference between these groups as well as in the atrial and the ventricular chambers. The data of the others leads (atrium n=94 and ventricle n=154) were affected by the FDA calculation.

Conclusion: The results shown a correlation between slew-rate and electric parameters per and post-op for the 3 groups for atrial and ventricular chambers; a new standard for sensing, pacing and slew-rate values were defined as optimal, acceptable and no-acceptable.

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Reappearance of the preexcitation syndrome after ablation ; significance

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Accessory pathway (AP) ablation is the treatment of choice of symptomatic patients (pts) with a Wolff-Parkinson-White (WPW) syndrome or pts with a malignant form at electrophysiological study (EPS). WPW can reappear after ablation. The purpose of the study was to look for the risk factors of AP reappearance and the clinical consequences.

Methods: AP ablation was performed in 327 pts aged from 8 to 77 years (37±16), with a WPW. Ablation failed in 6 pts. In other pts, the anterograde and retrograde conduction disappeared after AP radiofrequency ablation. Reappearance of AP occurred in 48 pts from several hours to several years. Their data were studied.

Results: There were no significant clinical differences between pts with and without reappearance of AF, concerning the age (33±16 years vs 36±16), the gender (male gender 28/48 vs 166/280), the reason of ablation (spontaneous malignant form: 10/48 vs 70/280; spontaneous AV reentrant tachycardia (AVRT): 29/48 vs 176/280, asymptomatic with electrophysiological signs of malignancy: 9/48 vs 38/280), the location of AP (left lateral AP: 21/48 vs 125/280, posteroseptal AP: 22/47 vs 119/280, anteroseptal: AP 5/47 vs 27/280). During the follow up, among 9 of 45 pts asymptomatic before ablation but with only inducible rapid AF at EPS, 2 pts became symptomatic and had inducible AVRT at the control. 29 of 202 pts with spontaneous AVRT presented recurrences of AVRT, except one and a 2nd procedure was required. Among 10 of 79 with syncope and signs of malignancy or spontaneous rapid AF, 2 pts have lost the signs of malignancy at 2nd EPS; 2 pts who presented only with rapid AF, had an AP with long refractory period but developed incessant AVRT's; 6 pts had still signs of malignancy, requiring a second procedure.

Conclusions: There was no significant clinical or electrophysiological cause that explains the reappearance of AP after ablation. The reappearance of conduction is generally associated with reappearance of all properties of AP associated with malignancy or AVRT, except in some cases. Pts without AVRT before ablation may become symptomatic and develop this AVRT after AP ablation.

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Arrhythmic storm in non ischemic patients treated with ICD device for primary prevention. Long-term follow-up and prognosis

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Background: Arrhythmic storm (AS) was defined for the purpose of the present study as the occurrence of frequent episodes (more than 3/day) of hemodynamically destabilizing ventricular tachycardia or ventricular fibrillation requiring immediately electrical cardioversion or defibrillation. The aim of this study was to determine the prevalence, causes and long-term prognosis of AS in patients with dilated cardiomyopathy, in whom an ICD was implanted for primary prevention.

Methods: This observational study compromised 135 pts (114 M, 21 F, 69 ±20 years old). The NYHA class was II (20pts), III (105pts), IV (10pts). The LVEF was 30 ±8%. The F.U period was 25±15 months

Results: AS occurred in 8 (6%) pts at an average of 18±7 months after ICD implantation. The mean number of arrhythmic episodes constituting AS was 25 ±22 (range 6 to 82) per pt. Hospital admission was required for 6 pts. The presumed causes of AS were: a) deterioration of the clinical status in 5pts, b) electrolyte disturbances (hypokalemia) in 2pts, c) unknown in 1pt. The LVEF of pts with AS was 23± 9%($p<0.05$). The pts with AS caused by wors-

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ening of their clinical status had an overall mortality at 6 months of 25%, and at 1 year of 63%.

Conclusions: 1) Arrhythmic storm is associated with a poor prognosis in nonischemic pts, 2) The triggering factors include mainly the deterioration of the clinical status.

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An unusual case of Mahaim fibers in hypertrophic cardiomyopathy

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Introduction: The coexistence of Mahaim fibbers (MF) and hypertrophic cardiomyopathy (HCM) is exceptional. We report an unusual case of a young female patient presenting with HCM and MF.

Case-report: A 17 y/o woman was referred in 1998 for a familial HCM screening. She had no symptoms; her surface EKG revealed a preexcitation suggesting a right anteroseptal WPW syndrome. The transthoracic echocardiogram (TTE) demonstrated an asymmetric septal HCM without LV outflow tract (LVOT) obstruction. The electrophysiological study (EPS) demonstrated the presence of MF (normal AH interval, a short and fixed HV interval and atrial pacing produced AH prolongation without change of preexcitation degree, indicating fasciculo-ventricular MF).

Eight years later (25 y/o) while the patient was doing well, the ECG was similar and TEE demonstrated the same aspect of asymmetric septal HCM without obstruction. Three months later the patient was pregnant and gave birth to a healthy baby. (During pregnancy: Delta wave was present and there was no LVOT obstruction). After delivery, Surprisingly there was no more preexcitation on her ECG and the TEE demonstrated now a significant LVOT obstruction with a systolic anterior motion of the mitral valve and an LVOT gradient of 36 mmHg. A second EPS was performed in 2008 and showed no more preexcitation. We speculate the hypothesis that FV fiber played in this case a similar pathogenic role as does the apical right ventricular pacing when it is used to decrease LVOT gradient in patients with HCM.

Conclusion: This case deserves to be reported because the association of MF and HCM is rare (only 3 cases reported in english litterature), the disappearance of MF during pregnancy has never been reported and the hypothesis that the RV preexcitation via FV Mahaim fiber played a role in decreasing LVOT gradient in this patient with HCM.

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Clinical value of left atrial appendage flow for prediction of successful catheter ablation for persistent atrial fibrillation

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Introduction: The purpose of this study was to determine whether left atrial appendage flow velocity, as determined using trans esophageal echocardiography (TEE), predicts the outcome after catheter ablation of persistent atrial fibrillation(PAF).

Method: 40 PAF patients (85% males, 60 +/- 11 years) underwent a stepwise ablation approach. The procedural end point was termination of persistent AF by catheter ablation, either by conversion directly to sinus rhythm or to atrial tachycardia. Left atrial appendage (LAA) peak flow velocities were measured with transesophageal echography and averaged within each RR interval of 10 consecutive cardiac cycles. Others parameters LA area, left ventricular ejection fraction, duration of continuous AF, Administration of amiodarone, were analyzed to determine the factors associated with procedural termination of arrhythmia.

Results: Among the 40 patients, all received a circumferential PV isolation, a linear ablation, and a continuous CFE ablation. Atrial fibrillation was terminated in 26 patients (65%) with a mean procedure time of 201 min+/-43 min. The preprocedural ejection fraction (p = 0.38), duration of continuous AF (p = 0.09) did not differ significantly between patients who had success of catheter ablation compared with those who had not. Peak emptying velocities of the LAA before catheter ablation were significantly higher in patients in whom PAF was terminated during the procedure (0.23 vs. 0.34, p = 0.002). On multivariate logistic regression analysis, only the mean LAA peak emptying velocity > 0.30 cm/s (p = 0.02, odds ratio [OR] = 9, 58 confidence interval [CI] 95% = 1.50 to 61.36), predicted successful catheter ablation for PAF. At 6 months follow-up, patients who underwent continued to have sinus rhythm, were significantly (p= 0, 003) higher in group who have LAA flow velocity > 0, 30.

Conclusion: High LAA flow velocity assessed by TEE is a clinically useful pre-ablation tool for predicting successful catheter ablation for persistent atrial fibrillation and maintenance of sinus rhythm.

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Interest of a new « Mode Switch » function in follow-up of atrial arrhythmias with dual-chamber pacemakers

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Introduction: Dual-chamber (DC) pacing benefits are impaired by the occurrence of atrial arrhythmias (AA). Pacemakers (PM) have been enhanced by a mode-switch function (MSF) which allows the switch from DDD(R) to DDIR pacing in presence of AA.

Materials and methods: We analyzed MSF at 6 and 12-month (m) follow-up in 369 patients (Pts) aged 77+/-9 y, free of permanent AA (59%), implanted with Kappa® DC PMs (Medtronic, MN, USA) for II and III AV block (65%), and sinus dysfunction (SD) (35%). 52% had no cardiopathy and there was no difference in electrical parameters at implant regardless lead and indication.
No specific programming was imposed. MS function data was collected at each follow-up: number of MS, average percentage of time in AA. EGM was used to confirm AA in most cases.

Results: The MSF shows AA episode rate of 61% at 6 m and 48% at 12 m. Moreover, 29% of pts (Gr1) had no AA during the 12 m, 11% had AA only during the last 6 m (Gr2), 24% only during the first 6 m (Gr3 and Gr5) and 37% during the 12 m (Gr4 and Gr6). Statistically, there was no significant difference between groups concerning the number of MS and between the percentage of time in AA at each follow-up .

Discussion: Long-term follow-up confirms results already described in the literature, and the MS event counters may predict the existence of AA. EGM confirms the specificity of this function. Number of MS is significantly high in SD ($p<0.05$), whereas the observation of a high number of MS may also point to oversensitivity of the MSF. Percentage time spent in AA is a revealing parameter, as it represents average time during which pts had been in AA since the previous follow-up.

Conclusion: This study confirms that AA occurrence remains an important complication in PM patients, regardless indication. Simple examination of MS recordings can lead to suspicion of major AA. The gravity of this AA can be quickly determined, but only detailed examination of MS episodes can confirm the diagnosis.

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Transseptal implantation of a left ventricular pacing lead for an ectopic location of the CS ostium in the left atrium

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Background: The success rate of left ventricular (LV) lead implantation for cardiac resynchronization therapy (CRT) is high. Congenital abnormalities of the coronary sinus (CS) are rare but can be responsible for unsuccessful implantation.

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